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An evaluation of the impact of digitalization on the financial health of commercial banks in Zambia – A case of Ecobank

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Abstract
The financial sector in Zambia has undergone transformation primarily facilitated by technology. To compete favorably, commercial banks have had to move with the times and digitize their operations to meet customer needs, improve efficiency, and ultimately, profitability.
The impact that digitalization has on the financial health of commercial banks operating in Zambia needs to be evaluated, with a specific case study on Ecobank Zambia. The theories applied in the study include the Technology Acceptance Model (TAM), and the CAMEL analysis to analyze the financial statements at Ecobank Zambia.
A mixed methods approach was adopted, combining both qualitative and quantitative data. A questionnaire survey with a data sample size of 206 respondents and a response rate of 89% was applied to establish the digitalized services available and some of the challenges faced by customers. Responses were collated from Bank staff as well as customers banking with Ecobank Zambia. Secondary data in the form of audited financials were analyzed to establish the trends in financial performance. The results and findings of the study were analyzed using excel and were depicted in pie charts, bar charts, table format, and open-ended verbatim responses.
It was revealed that digitalization had, to a fair extent, contributed to the sound financial health of Ecobank with financial performance with strong correlations to ratios such as Return on Equity (ROE) and Return on Assets (ROA). Challenges to digitalization were discussed such as high cost of investment in technology, internet reliability and cyber security risks. Recommendations were made on the best digitalization strategies that include partnerships with Internet service providers, Agency Banking and Service reliability to remain relevant.

Keywords: traditional banks, MNO, fintech, financial services, digitalization, financial health, ROE, ROA

Introduction

The banking industry has evolved significantly globally in recent decades due to the emergence of a globalized economy and the need for efficient financial services. Technological advancements and increased competition have led to the need for new approaches to financial services, resulting in the massive adoption of technologically advanced services to meet evolving customer needs. The internet has accelerated this process and revolutionized access to financial services for individuals and corporates alike according to a study by Kalliala (2012) [5].
The modern banking industry has a global reach and offers comprehensive financial services, leading to increased competition and price reduction among players. To create a competitive advantage, banks have adopted digitalization to keep pace with a rapidly evolving financial market economy. This was based on a study done by Aker and Mbiti (2010)[1]. Additionally, technological advancement has forced the hand of the industry so much so that the industry and technology cannot be separated. Although retail and corporate financial institutions have been a powerful force in fueling global economic growth and innovation, their omnipresence as financial service providers are at risk.

1. Statement of the Problem

The banking industry in Zambia has undergone a technological revolution, with mobile banking being one of the platforms that have changed the way customers interact with banks and access their money. The Bank of Zambia has embraced mobile money operators as a way of promoting financial inclusion, and traditional banks are investing in technologies to remain relevant and meet changing customer needs. Mobile network operators in Zambia, such as MTN, Airtel, and Zamtel, offer financial services alongside traditional telecommunications services, with over 9.8 million active mobile money wallet subscribers in 2021. Ecobank Zambia, which has been profitable for the past five years, aims to maximize its digital platforms to improve its financial performance and grow its market share. While past studies have shown a positive correlation between technological innovations and financial performance in banks, further analysis is needed to determine the specific impact of digitalization and mobile banking in the changing landscape of banking in Zambia.

2. Aim of the Study

The overall purpose of the study is to gain a deep understanding on the digitalization process of commercial banks and to further assess tangible benefits of digitalization and hurdles faced by Commercial banks in digitalizing their services. A case study was done with Ecobank Zambia one of the 19 Commercial banks operating in Zambia.

3. Specific Objectives

The following specific objectives were used as a guide for the study:

1. To ascertain the main digitalized services that have been adopted by Ecobank Zambia.
2. To establish the financial soundness trends of Ecobank Zambia from 2012 to 2021.

3. To identify the challenges of digitalization on commercial banks in Zambia from an Ecobank perspective.

Literature Review

The review of the existing literature was of great importance as it facilitated the establishment of the objectives of the study as well as the research design. The study looked at both empirical and theoretical literature of the research.

From a regional perspective, a study done in Kenya by Mwangi (2018) [9], was conducted to assess ROA, and the Independent Variables were; Deposit to Assets, Ratio, Loan to Assets Ratio, Income/Total Operating Loans), Fees and Commission. Panel data analysis was used. Panel data for 44 Kenyan banks was collected for the years from 2009 to 2013. The study found that investment in electronic banking enhances financial performance of banks through fees and commissions and was proved to have a positive effect on ROA.

Shehu, *et al* (2013) [11] in a study of electronic banking products and performance of Nigerian listed deposit money banks, examined all the twenty-one Deposit Money Banks (DMBs) listed on the Nigerian Stock Exchange and selected six (6) banks as sample for the study using systematic sampling technique. The study revealed that electronic banking products (e-mobile and ATM transactions) strongly and significantly impact on the performance of Nigerian banks.

Akhisar, (2015)[2] investigated the Impact of Technological Innovations on banking performance from 2005 to 2013. Electronic banking data of the countries was obtained from BIS (Payment Systems Statistics), World Bank's (World Development Indicators) and bank performance data from the IMF (Financial Soundness Indicators). The study found that there was a positive association between technological innovations and bank performance in both developing and developed countries with a stronger relationship in developed countries.

Similarly, in a study done by Auwal Musaa, Shafiu Abubakar Kurfib & Haslinda Hassan, (2015) on their work on The Impact of Online Banking on the Performance of Nigerian Banking Sector using secondary data and using frequency analysis of demographics of the banks, standard deviations, and mean differences (before and after the e-banking adoption) between banks. It is argued that majority of the business sectors, including banks, have taken advantage of technology to enhance their business operations. The study concluded that the use of technology had led Nigerian banks to e-banking, and this had revolutionized the entire banking industry by scaling borders and bringing about new opportunities.

Makoya and Omagwa (2018) [6] Contrary to popular findings, in a study of mobile banking and bank profitability in Kenya sourced primary data from 60 key informants in the banking industry through a structured questionnaire and analyzed the data using descriptive analysis and multiple regression analysis. The study found that transactions had a statistically significant effect on profitability while electronic funds transfer services and customization did not have a significant effect on profitability of 6 Tier 1 commercial banks in Kenya.

Similarly, contrary to other findings, (Mazana, 2016) [7] assessed the relationship between the 'Usage of Self-Service Technology' and financial performance of Commercial Banks in Zimbabwe'. The study used a case of a local Zimbabwean bank and data was collected using questionnaires administered to bank clients, workers, and management. The study findings indicated that there is a lack of confidence in using banking services and the banks are failing to tap into the informal sector for the largely unbanked market, thus failing to significantly scale up financial performance. The recommendations and Strategy given was alignment of information technology with the bank's business and corporate unit strategies.

Locally a study done by Haabazoka (2019) [3] was done to establish the relationship of various technological innovations on the financial performance of banks in Zambia. It particularly looked at various banking products including, mobile banking, internet banking and ATM transactions. The study reviewed monthly data for the 19 commercial banks and each of the innovations were reviewed to establish their impact over a 4-year period.

The findings from the study done by Haabazoka (2019) [3] revealed that bank technological innovations had a positive impact on the financial performance of commercial banks in Zambia. It was also established that mobile banking transactions had a strong positive influence on the financial performance of commercial banks in Zambia whilst Internet banking transactions had a weak relationship with the financial performance of commercial banks in Zambia. Automated Teller Machine transactions also had a strong positive effect on the financial performance of the financial performance of commercial banks in Zambia.

In another research paper done by Ngoma and Nuwagama (2014) [10] Analyzing Electronic Banking (E-Banking) as a tool to Improve Banking services in Zambia. This was both a qualitative and quantitative study highlighting that e-banking was under-utilized by the customers that lacked the skills to effectively use electronic banking platforms and that this led to client exploitation. The paper further highlighted that even though there were various innovations in the Banking sector, the available data was not enough to establish its usefulness.

Some of the recommendations from the study done by Ngoma and Nuwagama (2014) [10] called for more regulation by the central bank to ensure that consumers were protected, it further recommended for more sensitization from the industry players to sensitize customers on how to use digital banking platforms as well as to make some transactions only available electronically to encourage consumers to utilize online platforms.

A study done by Lusaya and Kalumba (2018) [4], on the usage of e-banking, accessibility of information regarding e-banking, and expense related to e-banking in Kasama highlighted that accessibility of information regarding e-banking, instruction level and the expenses related to e-banking were the substantial challenges to embracing and using e-banking by customers.

1. Technology Acceptance Model

The Technologies Acceptance Model was applied as a theoretical model for the study, this model relates the individuals' behavioral intentions and his/her ICT use. The Technology Acceptance Model (TAM) has been widely used to explain users' behavior towards various information technologies. It suggests that users' attitudes towards a technology are influenced by their perceived usefulness and ease of use. However, this model has been criticized for ignoring other factors such as social aspects of the users.

In a study by Wang *et al*. (2003) [12], the researchers introduced a new factor called perceived credibility to the TAM, which reflects users' security and privacy concerns in the acceptance of internet banking. The study also examined the effect of computer self-efficacy on the intention to use internet banking. The results of the study supported the extended TAM in predicting the intention of users to adopt internet banking. It also showed the significant effect of computer self-efficacy on behavioral intention through perceived ease of use, perceived usefulness, and perceived credibility.

This study highlights the importance of considering users' concerns regarding security and privacy when introducing new technologies, such as internet banking. It also emphasizes the significance of computer self-efficacy in influencing users' intention to adopt new technologies. By understanding these factors, service providers can better design and market their products to meet the needs and expectations of their users.

2. CAMEL Analysis

The CAMELS rating system evaluates the soundness of a bank based on six components: Capital, Asset Quality, Management, Earnings, Liquidity, and Sensitivity. Capital is important as it provides a fund against which the Bank can charge unexpected losses. Asset quality is essential to avoid decreasing the value of assets rapidly. Management's capability to control risks is also important. Earnings should be appropriate to maintain competitiveness, and liquidity is crucial to avoid a run on the bank. Sensitivity measures the bank's exposure to changes in interest rates, foreign exchange rates, and commodity or equity prices.

Theoretical Focus

To meet the research objectives, this study will primarily focus on assessing how digitalization has directly impacted the Banks Efficiency, Earnings and Liquidity. The secondary data collected during the period under review will be analyzed to identify common themes and trends.

Formulae

The following formulae was used in the study;

Return on Assets (ROA) is calculated as Net Income/ Total Assets; Return on assets is a tool used by managers and financial analysts to determine how effectively a company is using its resources to make a profit. It is denoted by the ratio below;

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Return on Equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders' equity. Because shareholders' equity is equal to a company's assets minus its debt, ROE is considered the return on net assets is calculated by dividing the company's income by its average shareholder equity;

$$\text{ROE} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}$$

Cost to Income

The cost-to-income ratio is one of the efficiency ratios used to gauge an organization's efficiency. It compares the operating expenses of a bank vis-à-vis its income. The lower the cost to income ratio, the better the company's performance. The cost to income ratio is calculated with the following formula:

$$\text{Cost-to-income ratio} = \frac{\text{Operating Expenses}}{\text{Operating Income}}$$

Net Interest Margin

net interest margin is a measure of the difference between interest paid and interest received, adjusted for the total amount of interest-generating assets held by the bank

$$\text{Net Interest Margin} = \frac{\text{IR - IE}}{\text{Average Enrning Assets}}$$

Where
IR= Investement returns
IE= Intrest expenses

Methodology

1. Conceptual Framework

The study proposes a conceptual framework to demonstrate the impact of bank innovations on Ecobank Zambia's financial performance. The adoption of innovations such as ATM, debit/credit cards, and mobile banking affects financial performance through various indicators. The adoption of such technologies is dependent on the bank's management conditions. The interaction between these independent variables and management conditions is expected to determine the bank's performance through indicators like ROE, ROA, liquidity, and service quality.

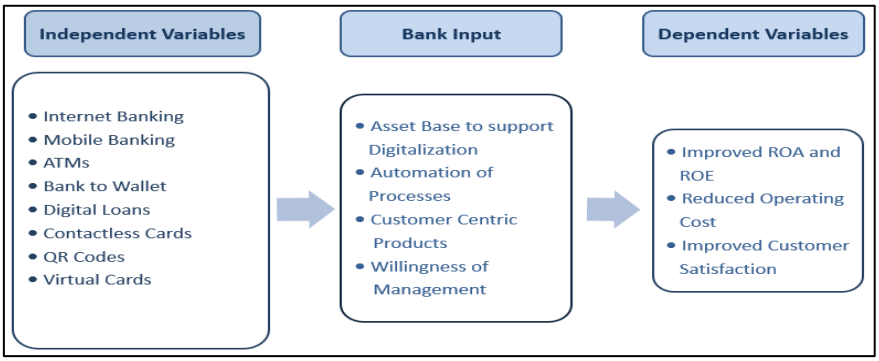
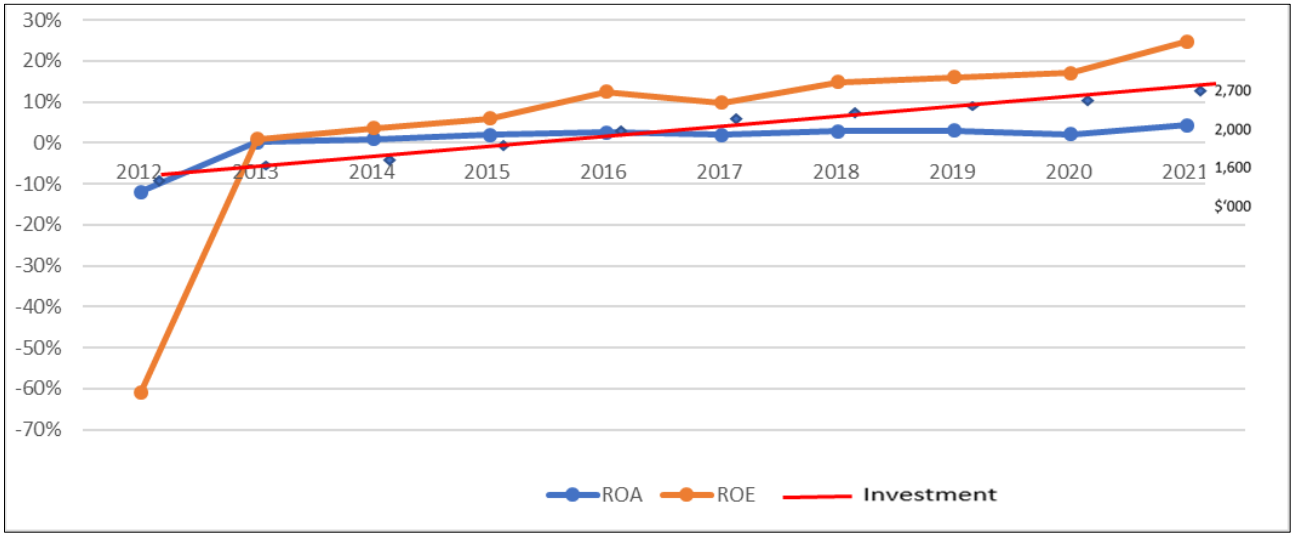


Fig 1: Conceptual Framework

2. Research Methods

The research study was anchored on a mixed methodology approach utilizing both Qualitative and Quantitative data. This was done by analyzing Secondary Data; Ecobank Zambia Audited Financial Statements and Bank of Zambia information whilst qualitative data was sought through the Survey Questionnaire with a combination of both closed and open-ended questions.+

Results, Analysis and Interpretation of Data



Source: Ecobank Zambia Audited Financials

Fig 2: ROA and ROE 2012-2021 Vs Investment in Digitalization

ROA and ROE were derived from the financials and plotted against the bank's cumulative investment in digitalization. when digitalization was still in its infancy, the Bank recorded negative ROE and ROE (2012-2013). It was further noted that the ROA and ROE did not improve immediately post digitalization, however, the ROA and ROE improved gradually.

Inferential Statistical Analysis of ROE and ROA

An inferential statistical analysis was done using the Pearson's Correlation Coefficient to assess whether the measures of efficiency had a positive correlation with investments in digitalization.

Table 1: ROA and ROE correlation with Investments

Period	ROA	ROE	Cumulative Investment
2012	-12%	-61%	1,250
2013	0%	1%	1,500
2014	1%	4%	1,600
2015	2%	6%	1,800
2016	3%	12%	1,900
2017	2%	10%	2,000
2018	3%	15%	2,200
2019	3%	16%	2,450
2020	2%	17%	2,550
2021	4%	25%	2,700

Correlation ROA	r (ROA)	r (ROE)
Correlation Coefficient	0.76	0.7

From the Pearson Correlation method, it was noted that both independent variables (ROE and ROA) had a positive correlation with investments in digitalization as the positive correlation coefficient values of r are greater than 0 and closer to 1. It was further noted that ROE had a stronger correlation to increased digitalization as indicated in the higher correlation coefficient. The Pearson Correlation formula is denoted as follows;

$$r = \frac{SP}{\sqrt{SS_X SS_Y}} \qquad SP = \Sigma XY - \frac{\Sigma X \Sigma Y}{n}$$

Where
r= Pearson correlation coefficient
X = one of the variables that are being compared
Y = the second of 2 variables being compared
SS = sum of squares or the sum of squared deviations
SSx = sum of squares for variable X
SSy = sum of squares for variable Y
SP = sum of the products of X and Y
n= the number of pairs of scores; each participant in a study will provide an X data point and a Y data point.

Cost To Income Ratio

The cost to income ratio is an important variable to consider when forecasting a bank's performance and determining its earning potential and efficiency. The lower the ratio, the better the company's performance, indicating more profitability. Ecobank has successfully reduced its cost to income ratio from 537% in 2012 to 35% in 2012. The table provided illustrates the average cost of running a small physical branch and highlights that this cost can be eliminated by implementing a fully equipped digital application. Some banks, such as Standard Chartered, have closed most of their branches to reduce operating costs and enhance profitability.

Table 2. Branch Operations Costing

Cost Item	Related Cost (Annualized) ZMW '000
Rent	204
Staff Cost (Minimum 6 staff)	1,000.00
Electricity Bill	24
Water Bill	12
Maintenance Costs	30
Equipment- Computers, Furniture, Printers	40
Stationary	25
Transportation	24
Delivery Services	10
Total	1,369.00

Source: Aggregate Branch Costing

From the data collected it can be estimated that a total of ZMW 1.3 million is required to operate a single Bank branch this is quite a high cost that needs to be factored into the bank's operations.

Table 3. Rating of Digital Services Available at Ecobank

How would you rate the following digital products available at Ecobank?	Excellent (Reliable) 5	Good 4	Average 3	Need Improvement 2	Unreliable 1	Total	Ranking
ATM	12	23	15	8	2	215	4
Mobile Banking	23	18	12	7	0	237	1
POS	12	32	15	1	0	235	2
Electronic Fund Transfer	7	24	26	2	1	214	5
Internet Banking	18	20	15	5	2	227	3

Source: Questionnaire Survey

From the data collected it was observed that Mobile Banking was rated highly in terms of the value that customers obtain from it as well as its reliability and efficiency with a total score of 237 points this was followed by POS services.

1. Summary of Findings

It is interesting to note that the study found that digitalization has had a significant positive impact on the financial health of Ecobank Zambia, particularly in terms of improving returns, increasing liquidity levels, and enhancing efficiency this was in line with similar studies done in the past. However, the study also identified several challenges associated with digitalization, including inadequate technological infrastructure, cyber security risks, low customer uptake due to high costs or technology illiteracy, and high associated costs of investment. These challenges highlight the need for banks to carefully evaluate the potential risks and benefits of digitalization before investing in such technologies, and to implement appropriate risk management tools.

Conclusion

Overall, the study suggests that digitalization has had a positive impact on the financial performance of commercial banks in Zambia, specifically in terms of Return on Assets (ROA) cost efficiency, profitability, and liquidity. This is similar to studies done by other scholars that highlighted the positive impact of digital platforms on banks. However, there are still challenges that need to be addressed, such as network/system failure, cyber security risks, low customer uptake, and high IT costs. Therefore, commercial banks in Zambia should focus on optimizing their business models and addressing these challenges to fully realize the potential benefits of digitalization.

Recommendations

The study recommends the following actions for Traditional Banks to remain relevant and enhance the financial health through digitalization:

1. Increase reachability by investing in digital platforms for growth.
2. Ensure backup ISPs to maintain service stability for customer satisfaction.
3. Manage costs by investing in digital platforms such as mobile banking, internet banking, POS and ATMs.
4. Implement Agency Banking to increase market share and profitability whilst cutting costs.
5. Automate KYC functions for account opening and digital loans with AI innovations.
6. Adopt Simple USSD platforms to increase reach to customers for mobile banking and reduced fees for bank to mobile money transfers.
7. Implement interbank transfers and digital credit facilities to improve loan disbursements.
8. Include Bancassurance for customers to purchase insurance products as an added source of revenue.
9. Ensure executive buy-in and sponsorship for successful digitalization.
10. Fully mitigate risks, such as cyber risks, to protect customer deposits.

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